Industrial Finishing

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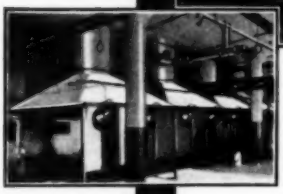
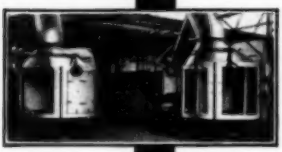
Spray Booths for Every Industrial Requirement





SPRAY Booths, to function efficiently and economically in regular production painting, must be especially designed around the particular product to be painted. All Mahon Spray Booths are designed on the same basic principle, yet few are identical . . . each installation is thoroughly engineered into the general production system with various types of conveyors and adaptors to facilitate handling of products in the process of painting.

Mahon Spray Booth engineers are specialists whose world-wide experience covers every industry where spray painting is an important part of production . . . Mahon Spray Booths are now in operation throughout the United States and Canada, France, South Africa, Australia, Brazil, Java and The Argentine.

The efficiency and operating economy, so outstanding in every Mahon Spray Booth installation, is due largely to the widely diversified experience of Mahon engineers and their intimate knowledge of modern spray painting production methods. If you are confronted with spray painting production problems, Mahon engineers are at your service. Do not hesitate to call on them.

THE R. C. MAHON COMPANY
Detroit, Michigan

Manufacturers of Spray Booths and Exhaust Systems, Industrial Ovens, Washers and Bonderizing Equipment.

MAHON

SPRAY BOOTHS & EXHAUST STACKS
· DESIGNED FOR FIRE SAFETY ·

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From the Editor's Desk

WITH THE development of so many different kinds of excellent measuring devices it is becoming more and more the practice of the larger industrial users of finishing materials to make a predetermined measurement of the various qualifications of finishes they use on their products, and today more finishing materials are purchased on the basis of performance instead of on the sole basis of price.

Tests are made on viscosity, opacity, transparency, coverage per gallon of material, color permanence, drying time, thickness of coating, the possible effect of other finishing materials used, luster, rubability, and finally the length of time the finish will last under certain prescribed conditions. Really, this is the logical basis on which to select and purchase finishing materials, and no one of the qualifications enumerated above should be unknown to the industrial user. Of course, more than one brand of material will usually meet the requirements and performance specifications set up. It is after the materials have successfully met all the required tests that the factor of price may properly enter into consideration.

* * * *

WE NEED to be reminded more than to be informed" of many things; among others, that the progressive manufacturers of finishing materials, supplies and equipment accumulate a tremendous fund of information about the merits, qualifications, and performance of their products and that many of them publish interesting portions of this valuable data in bulletins or pamphlets which can be obtained for the asking. It is suggested that users of finishing materials write for such information that they feel may be of interest in their respective lines of work. No obligation nor cost is involved, and the information acquired may offer an easy solution to some difficult problem that suggests a new idea in connection with the work at hand.

* * * *

AND IN reference to acquiring information, there's another very important source about which one user of finishing materials writes. He says: "We have two sources of supply for information, the trade journal and the right kind of salesmen. In fact it is firmly imbedded in my mind that the proper training of salesmen in a field such as the finishing materials product is the most important feature of the manufacturer. The properly trained man helps everybody; the poorly trained man just hinders. The wide-awake company should devote more time to these men in times such as these, and they will reap the harvest in the times to come."

W. H. Rohr

Managing Editor

COMPATIBILITY in WOOD LACQUERS

accomplished with

LINDOL-B

assures these advantages

Depth of finish	—	due to high refractive index of Lindol-B
Body	—	" " high specific gravity " " "
Flexibility	—	" " plasticizing ability " " "
Moisture resistance of film	—	" " Lindol-B being moisture repellent
Clarity and Hardness of film **Tensil strength** **Adhesion** **Minimum shrinkage**	—	" " blending ability of Lindol-B

Checking and cracking are eliminated and a permanence of the above properties is assured by the plasticizing power and the absolute non-volatility of Lindol-B.

LINDOL has stood the time test of service.

Tests

Purity — No darkening should occur when Lindol is treated with concentrated sulphuric acid.

Solubility — No cloudiness should occur when resin solvents are excluded from a clear lacquer.

Compatibility — Note the quantity of hydrocarbons necessary to cloud clear lacquers plasticized with Lindol-B.

Lacquer Manufacturers — We will be glad to submit samples, technical data and quotations upon request.

Lacquer Users — Insist on Lindol plasticized lacquers and improve the quality of your finish.

CELLULOID CORPORATION

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290 Ferry St.
Newark, N. J.

Chemical Specialties Division

Sales Office
10 E. 40th St.
New York, N. Y.

A Chief Chemist reveals interesting and significant facts about some—

New Lacquer Developments

By
*C. W. SIMMS**

It is the purpose of this article to bring to the attention of the finishing trade some of the more outstanding developments in the lacquer industry during the past few years. Due to the large amount of ground to be covered, the subject will be treated in two parts. First, the developments in the formulation of clear lacquers, and secondly the developments in the formulation of pigmented or colored lacquers

IT IS QUITE natural for young industries to be continually subjected to changes. That is the spirit of progress. The inherent cause of these changes is, of course, the natural instinct to improve and perfect existing things.

Most particularly the lacquer industry has been, and is, continually experiencing changes. These changes are stimulated by competition—competition of lacquer with other types of finishes, competition of lacquer manufacturers, competition of raw material producers, and competition of consumers. All are the result of a keen desire for some improvement, something which is unique and which will open up old as well as new fields.

Lacquer manufacturers must be keenly alert to the changes that are taking place; otherwise they are apt to find themselves antiquated within a surprisingly short time. They must, at all times, keep in touch with their four principal sources of information. First, they must watch keenly the ever increasing number of new finishes other than lacquer, which are designed to compete with their product. Secondly, they must take full advantage of the vast amount of research being carried on by raw material producers. The purpose of this research is twofold; for the development of new products and the improvement of existing ones. Thirdly, lacquer manufacturers must keep in close touch with their own customers, suggesting improvements which will in the end

* Wabash Products Co., Terre Haute, Ind.

prove mutually beneficial. Lastly, they must work continually to improve their own products and to be sure that they are utilizing to the best advantage the materials which are commercially available.

Clear Lacquers; Furniture

Since the furniture industry is responsible for the use of the largest volume of clear lacquer, and has been rather receptive and eager to adopt some of the new developments, it is quite fitting that the changes in this type of lacquer formulation be considered first.

At the time when the furniture industry began to adopt the use of lacquer as a finish the lacquer manufacturer was comparatively unprepared to meet the exacting requirements of some consumers. In order to approximate the gloss, body, and adherence of the varnish finish, lacquer manufacturers realized the necessity of using rather high proportions of certain resins in their formulas. At that time they were limited to two types of resins, both of which had their disadvantages.

There were the natural resins such as dammar, shellac and elemi, and there was ester gum which may be termed a semi-synthetic resin. The natural resins were quite high in price, and the supply as well as the quality was not consistent. Ester gum on the other hand, being a chemical combination of glycerine and rosin was available in very uniform quality, unlimited supply, and at a more or less stable price. Ester gum, however, lacked many desirable qualities. It could not be used in very high proportions without making sacrifice in durability, and it would not rub nor polish to a permanently clean finish.

Synthetic Resins for Lacquers

Recent researches in the synthetic resin field have yielded resins which have largely overcome the faults of furniture lacquers as they were made a few years ago. The two types of synthetic resins which have been developed most extensively for lacquer use are the condensation products of phenol (carbolic acid) and formaldehyde, and the condensation products of glycerine, phthalic anhydride, and fatty acids. While there are other types of synthetic resins on which a great deal of work has been done they have not shown such great promise as lacquer resins.

Furniture lacquers containing synthetic resins have many advantages over the old type. When properly formulated they are far more resistant to sunlight. They do not harden and become brittle nearly so rapidly as the old type lacquer made from ester gum or the natural resins. Being more flexible they will withstand the contraction and expansion of wood much better than the old type lacquers. By use of the synthetic resins, lacquers can be made to contain more solids at spraying consistency which, of course, manifests itself as increased body, a property which is extremely welcome to the furniture manufacturer.

Some of the synthetic resins also impart a depth of film which is not excelled by any other type of lacquer. One of the most outstanding advantages of lacquers made with the new synthetic resins is the fact that they can be rubbed to a much cleaner and higher polished surface with much less effort. This type of lacquer is also materially tougher than the old type, having greatly increased resistance to abrasion.

Some of the earlier lacquers printed quite readily for several days after application due to the solvents being retained by the gums which were used. A few of the synthetic resins have practically eliminated this trouble by giving up solvents and drying hard in a very short time.

Another step forward was taken by pyroxylin manufacturers in further lowering the viscosity of nitrocellulose. While this improvement is also accompanied by a slight decrease in durability, it nevertheless offers the lacquer manufacturer an opportunity to produce extremely high-bodied lacquers at spraying consistency for use where durability is not of paramount importance.

Non-yellowing; Alcohol-proof

Another development worthy of note is a new synthetic resin which is extremely clear and which, when properly formulated in a lacquer, produces a film which practically eliminates yellowing in the sunlight. This feature is particularly attractive to manufacturers of light finishes such as silver oak, maple, etc.

Some of the synthetic resins are quite insoluble in alcohol and therefore are admirably suited for making alcohol-proof finishes. By means of these resins a finish can be produced on which pure grain alcohol can be spilled and allowed to dry with a bottle placed on the wet alcohol, without leaving a spot. It naturally follows that such a finish will be quite resistant to mixtures of alcohol and water, such as whiskey and other alcoholic beverages.

After reviewing the recent improvements in the formulation of wood lacquers, it is astonishing that lacquers made the rapid progress they did prior to these developments. It is particularly remarkable since the first lacquers offered to the furniture trade, while they were far from perfect, were not even consistent; the user was continually having troubles, most of which were new to himself as well as the lacquer manufacturer.

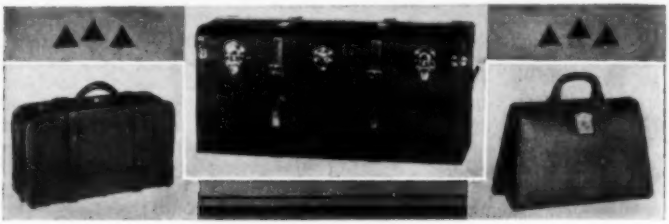
Undercoats; Sealers

The lacquer industry, prior to the last few years, was sorely in need of an undercoat for wood finishing which would be in keeping with the efficiency of the lacquer finish. Shellac was more or less a standard where undercoaters were used. Quite naturally on the cheaper grades of furniture there was a great deal of substitute shellac used. These types of undercoats were unsatisfactory for several reasons. They become quite brittle with age and have caused trouble by cracking underneath the lacquer finish. This need for a better undercoater brought about the development of the pyroxylin sealer (lacquer sealer, sanding sealer, etc.).

The pyroxylin sealers were adopted by the furniture industry more universally than any major development since the advent of lacquers. They enabled furniture manufacturers to increase production schedules very greatly, as well as give a resultant finish which was more durable than those produced with certain shellacs and substitute shellac undercoats.

Lacquer sealers are essentially lacquers which are formulated in such a manner that they dry rapidly and can be sanded to a very smooth surface with considerable ease. This is accomplished by the use of solid ingredients which, when properly formulated, release

(Continued on page 54)



Lacquered Leather Goods

By
R. C. MARTIN

How colored lacquer dopes are prepared and applied to leather surfaces which are to be made into traveling bags, and motor car trunks, and how these treated surfaces are finally finished with clear flexible lacquer

GLADSTONE BAGS are made of cow hide. The hides are received in definite thicknesses and in surfaced condition; they are shaped and formed by the manufacturer so as to be suitable for the sizes of articles for which they are intended. After being thus roughly formed, the sidings receive several brush applications of coloring matter.

This is arrived at in the following manner; colors in castor oil, or sometimes specially ground pigments in various grinding vehicles, are reduced with a special lacquer thinner constructed to satisfactorily reduce the colored paste, as well as the leather dope which will be mentioned later.

Colored Dopes Brushed On

The first direct application is of a necessity reduced to a greater degree than succeeding applications. The material is forcibly brushed and worked into the hide siding, and allowed to air dry outside.

The treated hides are strewn across tracks prepared for same, and exposed to sunlight. The brushes used are of the stiff bristle type. This first application is made up in the proportion of about one gallon of thinner to 1½ or 2-lbs. of paste. This concentration of paste, involving the breaking up of color in the manner above described, is in order to produce the greatest degree of penetration of coloring matter into the hide; it is considered necessary in view of the ultimate bending of this siding in the shaping of the gladstone on the finishing frame.

After the point in air drying is reached whereby the coating is of a slick tacky nature, the hide is ready to receive a second coating. The first coating, so applied, does not entail the addition of leather dope solution (which is a basic nitrocellulose). The additional thinner is used as a reducing medium, causing the drying action that takes place.

The second coating is applied

in the same manner as described except the proportions of material vary. About 12-oz. of pigment is used per gallon of leather dope solution; it is thoroughly mixed and reduced to proper consistency with special leather dope thinner, as mentioned above. This coating is likewise exposed to dry, the drying time being much quicker than in the first application. Sometimes a third coating is applied—this in the same manner as above, except the pigment content is reduced to 8-oz. per gallon.

Graining; Waterproofing

After receiving the above applications, the siding is placed in a heated press mold where the graining is imprinted onto the hide. After a thorough drying, the hide is reënforced with heavy cardboard, the cardboard being applied under pressure with glue preparation. The siding is shaped, bent onto the frame, sewed, riveted, and enters the shipping floor a finished product.

To further waterproof these bags, a brush application of flat flexible lacquer is sometimes applied. This added application does not detract from the true leather-like appearance of the surface as might be assumed.

Automobile Trunks

The finishing of trunks in a lacquer schedule (special reference to trunks as a part of motor car equipment) is one involving relatively the same general type of lacquer enamel as appears on the car body itself, except the material is constructed along the lines of a greater degree of contraction and expansion. This type of material is applied over a fiber surface, and in most instances is applied directly onto the fiber itself.

The usual method of application is by spray gun. The finish, being of the flexible type, requires a longer drying time than the regular type of lacquers. For this reason care should be exercised to see that the coated fiber trunks are kept in a drying room free from the collection of dirt and foreign material. The trunks are usually coated with a material to match the standard colors appearing on the motor car surface itself.

As a Belting Cement

Nitrocellulose materials, constructed in such a manner as to produce a great degree of adhesiveness, are used in the leather belting industry. Heavy thicknesses of leather belting are split [or scarfed for a lap joint] and roughened to a marked degree, on the split side, by violent rubbing with a wire brush. The cement, reduced with the proper reducer, is applied with a hand brush of medium stiffness. The half section used in the formation of the completed belting, roughened, is coated in the same manner.

The two treated sides are joined together and forced into close union by clamps, after which they are slowly forced into a heating chamber—or they may be air dried. As the belting protrudes from the chamber the clamps are loosened and the edges of the belting are smoothed of the excess lacquer forced out of the joint. The roughened surfaces coated with the cement become thoroughly knitted together, having the appearance and strength of solid leather belting.

Hercules Advertising Manager Dies

Mr. Nelson S. Greensfelder, advertising manager of Hercules Powder Co., Wilmington, Delaware, and former Head of National Industrial Advertisers, died Sunday morning, April 5.

Modern Spray Equipment Maintenance

By
L. T. BAXTER

Most spraying equipment now on the market has had the "kinks" ironed out, and if given intelligent care and attention, it is capable of producing excellent results

YOU WHO are sufficiently familiar with woodworking to know what a veneer glue spreader is, what do you suppose would be the result if the corrugated rolls of this machine were not cleaned at the end of the day's run? How long would be required the next morning to get this machine in condition to operate?

The basic elements of glue and finishing materials are far different, but both have adhesive properties that produce similar results if careless methods are tolerated in their maintenance. The majority of spray equipment troubles are a direct result of neglect or improper cleaning of equipment after use.

System Employed

Management must take the first step in enforcing cleanliness in the spray room. Our equipment comprises ten spray booths, and each operator is held responsible for the condition of his booth and spray equipment. Fifteen minutes before the plant closes for the day, a buzzer in the spray room announces the daily cleaning period. Spray operators immediately cease all operations and start cleaning guns and material hose. All unused finishing materials are re-

turned to the supply room, poured into their respective drums and pressure-feed tanks are cleaned.

The spray operator and helper's rate plus burden amounts to 80c per hour. Figuring six days per week and 50 weeks to the year, the annual cost of cleaning this equipment is $600. Our company feels that this is a good investment, the returns being, (1) smooth and uniform operation, (2) high quality of finish (other things being equal) and (3) longer life for the equipment.

Spray Gun; Fluid Hose

The spray gun is cleaned by removing the spray head assembly from the gun, and washing same in the particular solvent for the finishing material being used. The spray head is rinsed thoroughly in clean solvent, wiped off and reassembled, after which the gun is oiled. It is then ready for immediate use next morning. A gun cared for in this manner will not require probing or prodding with wire or finishing nails to remove dried material from either the center or spreader holes in the air cap.

Once every three months all guns are sent to the tool room, dismantled, cleaned thoroughly, inspected, vaselined (fresh vaseline being placed in the fluid needle spring housing) and worn needles replaced.

Our spray booths are equipped with hose-cleaning apparatus which consists of a small tank containing the required solvent for the material being used in that booth. This tank is connected to the main air line and is equipped with hose connection, air and fluid valves. For cleaning, the fluid hose is connected to the tee, and air is turned on; this forces the remaining material out of the hose. Solvent is gradually fed into the hose, which thoroughly cleans the walls of the hose. Air is again allowed to pass through the hose for a short time to complete the cleaning and evaporate the solvent. The hose is then removed and connected to the spray gun in readiness for work next morning.

Pressure Feed Tank

I have heard arguments pro and con on emptying the pressure feed tank at the close of the day and returning all material to the drum. Some finishers claim that it is a waste of time and material. I maintain that eventually it will effect a saving, especially where lacquers are used. We have a material supply room where drums equipped with power agitators and spigots, are used as containers for all finishing materials.

Agitators are started each morning about an hour before the plant starts work. This room is warm, hence the material is in good condition. Colored lacquers are always uniform in color when applied and all materials are ready for use at starting time. Another advantage of emptying the pressure feed tanks each night, is the opportunity it affords for cleaning the tanks. Daily cleaning of tanks eliminates material-clogged passages in the tank lid, air regulator screen and safety valve.

Air Filter

The air filter or transformer is drained each night and the pressure is released until next morning, thus relieving all pressure from the regulator diaphragm. This increases its useful life. At some seasons of the year and in certain localities, the humidity may be exceptionally high, caus-

ing considerable moisture to collect in the filter. When excessive moisture is encountered, the filter sack should be replaced with a dry sack. The saturated waste may then be dried and used again.

Under normal operating conditions, there should not be a great deal of oil in the air line. If an excess of oil is encountered in the filter, in all probability, the compressor is pumping oil and requires new rings.

Conclusion

I believe our system of cleanliness is correct. Windows, electric light globes and reflectors, floors, walls, and ceilings in the finishing room are cleaned regularly. Equipment is maintained and serviced. Daily cleaning periods are allowed all spray operators. Equipment is provided to facilitate cleaning. Finishing materials are in proper condition to start work first thing each morning. Operatives are treated fairly. We expect results both in quality and quantity of work produced—and we get it.

Rubbing Machines

Much has been said and written of late about portable rubbing machines, and it must be admitted that they possess the same advantages of any portable device, in the main. But it is worth while noting that the larger size rubbing machine, which is stationary, is still supreme on material within its scope, from a production standpoint. Some may not have stopped to consider it, but this machine is adapted to coarse rubbing as well as to fine rubbing, pumicing or rotten-stoning. And in a pinch, sanding can be done. In fact, when we come to consider it, there is much in common between the design of this machine and that of the automatic stroke belt sander, though this one is minus the belt.—J. E. H.

Striping Tools

There are now a considerable variety of striping tools on the market, so that one need never lack for just the right tool for a given kind of work. Even the man who needs such a tool for only a limited amount of work need not be left out, for there are some that combine a low price with the best of results. One tool of this kind that I have noticed opens and closes much like a pair of dividers, with a spring action at the top, for gauging stripes at different distances.—R.C.E.

Sherwin-Williams adds Brushes

Announcement has just been made to its agents and dealers that The Sherwin-Williams Co., is now marketing a complete line of brushes for every class of retail and painter trade.

Great interest has been shown in the special features safeguarding the quality and suitability of the new Sherwin-Williams brushes for the finest work. The brushes are made by most modern methods and will be sold by the company's representatives as part of their regular line.

Headquarters for brushes will be maintained at the company's executive offices at Cleveland, but brush stocks are being carried at all of the company's warehouses and shipping points.

"Falcon" Tubular Electric Heater

The H. O. Swoboda, Inc., (consulting electrical and mechanical engineers) 3400 Forbes St., Oakland Sta., Pittsburgh, Pa., has ready for distribution its Bulletin No. 250, which supplements previous bulletins on "Falcon's" large melting and coating tanks for asphalts, tars, compounds, oils, varnishes, and similar viscous substances. It points out the advantages of the tubular electric over the tubular fluid immersion heaters.

Quality Desk Finishing

By
F. W. PURDON

Superintendent of Finishing at the Standard Furniture Co., Herkimer, N. Y., explains intimate facts about desk finishing with special emphasis on the difference between cheap finishing and quality finishing insofar as materials are concerned

TO OBTAIN the specific type of finish required and demanded for office desks—having the durability to withstand wear and all of the severities of weather conditions, the temperature and humidity conditions found in the different sections of the world, such as the extreme heat of the tropics, the severe cold of the northern winters, the moist condition along the seacoasts, and the rapid changing humidity conditions of the inland states—has of itself produced a problem in quality wood finishing. Our solution of this problem has embodied many years of experimental and research work to find suitable materials and methods of application by which the finish on Standard desks may be produced so that they will have the qualifications to successfully withstand the severity of these conditions in general.

There are two distinct plans to follow in finishing wood. In one the reduction of cost is the main objective. In the other the chief issue is to produce a finish that in all respects has the durability which should be found on fine furniture.

The severe usage that most office desks receive demands a finish of great durability, as well as beauty. The intelligent purchaser of office furniture expects, and justly too, that durability in wear shall be found in the finish of the desk purchased.

To the uninformed it perhaps seems a small matter to produce a finish embodying these exacting qualifications, but like all other finishing jobs, desk finishing has its separate problems which have to be solved. In the finishing of our desks the foremost consideration is always quality. We use no substitutes in the finishing process.

To produce this quality finish we go in for fine machine work and cabinet work on the very best grades of cabinet woods. Desks enter the finishing department in the finest possible condition to receive their finish or dress. As the desks enter the finishing department we give them a very rigid inspection for defects before the actual process of finishing is started.

Stains; Fillers

Generally speaking the first operation in the finishing department is staining. Again this may seem just ordinary to the uninformed, but there are many types of stain that can be employed, such as oil stains, pigment stains and spirit stains, which would reduce the cost of this operation 50%, but Standard desks receive only the very finest type of water stains, formulated with acid colors and chemicals which produce an absolutely non-fading color.

Wood filler is another of the very important materials used in the finishing process. Much depends upon this material. It furnishes the foundation upon which the finish is built. In order to avoid sacrifice of durability through adulteration, we have our wood fillers ground under very carefully balanced formula, only the finest grade of materials being used.

Wood filler is composed of silex, linseed oil, japan dryer and fine pigment colors. Only the finest type of crystalline quartz silex is used. Morphous quartz—that is the soft quartz silex—could be used at a large reduction in costs; also inferior grades of linseed oil and colors, but again there would be the sacrifice in durability. The linseed oil used is of the very finest grade.

Wood filler is subject very often to adulterations, and like many other finishing and painting materials, it is manufactured to sell at a price. Any adulteration of the silex base or substitute for linseed oil in the manufacture of wood filler represents sacrifice of durability, such as shrinkage of finish or a soft undry foundation upon which to build the finishing coats. Anyone familiar with wood finishing can readily understand what the results from an inferior wood filler would mean.

Shellac; Varnish

Next in order comes the coating materials, such as shellac, varnish and lacquer. The quality of the finish depends upon these coating materials. There is positively no end to the line of substitutes which could be used in coating, if the finish were being produced from the viewpoint of cost reduction. Shellac substitutes may be purchased at less money, but we use only the very best grade of wax-free shellac.

To the average person varnish is just "varnish," but to one

Tradition

● When a firm maintains the uniform excellence of its product for nearly half a century—that fact becomes a tradition of which it can well be proud.

ZAPON
PYROXYLIN
LACQUER

ZAPON

The standard since 1884 needs no introduction—it stands on its record.

THE ZAPON COMPANY
A Division of Atlas Powder Company
STAMFORD, CONNECTICUT

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versed in this line, it may mean almost any kind of a concoction of gums and liquids. Varnish is formulated in hundreds of ways that range in selling price from $.90 to $5.00 per gallon. There are two distinct types of varnish—short oil and long oil. Long oil varnishes are known as spar varnishes or exterior varnishes. Short oil varnishes are known as polishing or rubbing varnishes, or interior varnishes. Varnish gums have a wide range in type, copal, zanzibar, dammar, kauri, and rosins, with many other gums too numerous to mention. Rosin is perhaps the cheapest gum in the category, while African kauri heads the list, since it is the hardest gum known.

The various types of varnish are made by blending the various gums with oils and turpentine. To find a varnish suitable for office desks—one that will dry hard enough to resist the severe wear and still retain the proper amount of elasticity to avoid checking and chipping after a few months' service—represents the problem in varnish selection.

The varnishes we use are carefully formulated to obtain the durability to withstand wear and the extremities of all atmospherical changes (temperature and humidity) which are very severe on varnish. Standard varnishes have been selected for the specific requirements after many years of experimental research study.

The many other finishing materials which are constantly used to produce the quality finish found on Standard desks, are purchased without regard to cost, but they must meet the rigid test of quality which is demanded of each material. Alcohol, turpentine, benzine, solvent naphtha, rubbing oil, etc., must constantly be of the highest standard of quality, or they are at once rejected.

Lacquer

Wood lacquer holds a very important place in the finish of Standard desks. The Standard Furniture Co., are pioneers in this type of finish. They have led the field of desk manufacturers in offering to the public the same hard wear-resisting finish on desks which is popular in the motor car finishes today, and which has in the past 8 years revolutionized the finishing of wood and steel.

Atco Products Acquires the Atomister Corporation

The Atco Products Corp., Scott Ave., & P. R. R., Rahway, N. J., announces that it has taken over the plant and business of the Atomister Corp., of Rahway, N. J., manufacturer of the "Paint-O-Mister" portable electric sprayer, which the Atco Products Corp., will now manufacture and sell. The Atco Corporation states that it is equipped to fill orders for the "Paint-O-Mister" and parts; or promptly make repairs to any "Atomisters" or "Paint-O-Misters" now in use.

Ault & Wiborg Elects New Officers

The Ault & Wiborg Varnish Works, Inc., Cincinnati, Ohio, announces that following the transfer of Mr. Bromwell Ault, formerly president and treasurer of the Ault & Wiborg Varnish Works to executive duties in the main offices of the International Printing Ink Corp., at New York, Mr. Joseph R. Esposito was elected to succeed him as president, and Mr. C. R. Bragdon as treasurer.

Mr. Jos. G. Morris, formerly a vice-president of the Cook Paint & Varnish Co., has been made works manager at Cincinnati, and Mr. J. A. Henry, formerly superintendent, is field engineer in charge of technical service to customers, upon which the company has always laid great emphasis.

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The very latest, newest shade for Walnut Furniture—secured with

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English Walnut
Paste Filler

A beautiful rich warm brown color, perfectly suited to the latest designs in Walnut Furniture. Produces a rich, clear transparent color on both butt and straight grained Walnut.

Write for a 25 lb. sample at the drum price. Do it today.

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PROTECTIVE SPRUANCE QUALITY FINISHING
PRODUCTS

What you should know about—

Non-Grain Raising Stains—II

By A. P. NONWEILER

Explaining the theory of wood staining and revealing what action takes place when certain stains are applied to sanded wood surfaces and followed by various type of finishes; why non-grain raising stains have come into use so extensively

PROBABLY every wood finisher is familiar with the physical structure of wood. It seems sufficient for our purpose to say that microscopically it is composed of cells of honeycomb structure. Optically it is composed of fibers, pores and medullary rays, each performing a separate duty. The medullary rays serve to distribute food horizontally; the pores provide passage for moisture, and the fibers give strength. Wood is composed chemically, principally of cellulose and lignin; both are considered incolloid chemistry as gels of the reversible type.

Wood is hydroscopic; it takes on moisture when the moisture content in the air is greater than in the wood, and gives it up when the air is drier than the wood. When wood absorbs moisture, it swells; when it gives up moisture, it shrinks. The swelling pressure of wood is enormous. The ancient Egyptians harnessed this pressure to split stone, by simply using wooden wedges and then wetting them.

When wood is sanded, the fibers at the surface are mangled and shredded even though to the hand they feel quite smooth. When water stain is applied to wood, the mangled fibers swell and twist out of shape. Upon drying they shrink, but do not come back to their former places; consequently this raised grain results in a rough surface. Before sanding it is necessary to apply a size coat of shellac to prevent sanding through the stain and to stiffen the fibers so they will break off more easily when sanded. Unfortunately in cutting off these fibers, a tiny pit is created that is quite harmonious to the formation of pin holes. Another tragedy is that the entire surface structure is distorted by swelling, and drying further down does not occur as quickly as at the surface.

Who is there so well versed in woodworking or wood finishing that he can accurately state just when all the water is expelled and the shrinking is over? Foremen differ as to the drying time required for water stain. Some say two hours, some six, some 12, some 24. I am inclined to favor the 24-hour chap. Yet observe how important it is to wait until all shrinkage is over before applying lacquer coats. How many complaints of hungry, skimpy appearances of finishes are traceable to this shrinkage; how much of the gray pore and peeling trouble is due to the excessive moisture content of wood?

Now about uniformity. Wood grows differently at different times of the year. In summer the cells

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Goodbye forever to Flash and Streak! That is the promise and the *performance* of Murphy Flat Varnish No. 22.

And that is not all. It's just a beginning. Say goodbye to clouding and settling. Say goodbye to water and pumice finishing. Say goodbye to slow drying in poor weather.

Murphy Flat Varnish No. 22 is non-pigmented and gives great transparency. It gives a finish superior to rubbing with water and pumice, because of the absence of the thousands of scratches of rubbing. It has excellent building quality and dries fast and hard—most important in maintaining production schedules. And remember, above all, that Murphy Flat Varnish No. 22 does not flash or streak.

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Flat Varnish No. 23 possesses all the qualities of uniformity and extreme clarity of No. 22, but dries to a soft sheen.

Murphy Flat Varnish No. 24

Flat Varnish No. 24 dries to a high semi-gloss but otherwise shares the characteristics of No. 22 and 23.

grow close together forming a dense structure; in the spring it is more porous.

How Stain Enters Wood

It is interesting to observe the different manner in which stains enter wood, yet the average finisher more vaguely terms this as "penetration." It determines whether a color is uniform or whether it is spotted. Let us see why.

Water stain enters wood by *absorption* and capillary attraction, whereas oil stain enters wood by *adsorption* and capillary attraction. Consider now the fibrous structure and the dense and porous growth of wood.

In water stain the water is absorbed, soaked into the fibers, and because of the resistance of passage absorption offers to capillarity, the stain is held together near the surface and is not permitted to race down the crevices between fibers, because the forces of absorption and cohesion are greater than the forces of capillary attraction. Consequently more stain is retained at the surface to dye the wood than if its entrance depended upon capillarity. Such capillarity is influenced by the resistance of the dense growth of hard spots, and aided by the more porous or soft spots where there are more openings and naturally more stain enters, producing darker color by sheer cencentration of dye.

Oil stain enters by adsorption and capillary attraction. Here the entrance is allowed to follow the crevices without the restraining force of absorption, and consequently it penetrates deeper into the wood. Wherever the dense hard spots are, the color is light; wherever the porous soft spots are, the color is dark. The general apearance is not uniform.

The question of uniformity is of debatable importance. The majority insist the unformity of water stain somewhat defeats the ultimate intention to produce and enhance the natural beauty of figured woods, by giving a dull, even, almost monotonous color effect of insufficient depth and contrast. On the other hand they insist the contrast is too great in oil stain and for this reason, coupled with its other characteristics, they will not use it.

Stain Satisfaction; Economy

This situation naturally suggests and actually creates the necessity of a happy medium. It creates the desire for a stain of the following qualities: Fast to light, non-bleeding, non-grain raising, quick drying, more uniform than oil stain, more contrasting than water stain, and last but not least, more economical.

Permanent, penetrating, non-grain raising stain is the stain that answers all of these needs. It guards against pinholing because it does not rupture the structure of the wood. It eliminates (1) the cost of application, (2) the cost of the material used in wash-coating, and (3) the necessary sanding operation. It also saves the intervening handling operations, their cost, the time and the floor space required for them.

The colors are the same as used in water stain, fast to light, not soluble in lacquer solvents, and consequently they don't bleed. They are not soluble in oil filler vehicles or adulterants, and consequently are not washed out by the wiping of the filler.

They are easily applied, may be brushed, sprayed or dipped; they spread nicely and mix perfectly with the quick-drying plastic type wood putties. The spreading of

"If man was meant to FLY he'd be wearing WINGS"

So spoke Potiphar Pringle, sage of Squeedunk County, as the first flying machine in the neighborhood collapsed into splintered bamboo in Squire Pringle's briar patch.

Twenty years later they shipped Potiphar's ashes back home by air mail. The "gol-derned fools" who persisted in having faith in airplanes had revolutionized the transportation of the world!

We recall with particular respect and gratitude the pioneer users of lacquer, who — scores of years ago — helped Egyptian to grow into one of the outstanding producers of fine lacquer. They had vision.

Even today it takes vision to let lacquer tackle your hardest finishing problems — and lick them. Or, when you're all set on your finish, it takes vision to realize that an even *better* way can be found with the cooperation of Egyptian.

Such helpful expert cooperation is yours if you merely lift your telephone receiver and get our representative.

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90 West Street, New York City

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USES EGYPTIAN LACQUER

a stain is dependent upon its surface tension, rate of evaporation, solubility of color, degree of absorption, capillary attraction and the physical condition of the surface. Permanent, penetrating, non-grain raising stains meet all of these conditions.

Mahogany Finishes

Of the mahogany furniture manufactured today the red-brown finish seems to reign supreme, while in fixture work, which in all probability is in the majority, the popular finish trend is toward antique or Adam brown. The finish procedure for both are practically the same with the exception of the stain. One method, which if followed closely is productive of excellent results follows:

On fixture work the first operation is to spray a brown mahogany water stain.* This should be allowed to dry for 12 hours so that sufficient time will be allowed for the wood to return to the moisture content it contained before being stained. Then a spray coat of shellac (1 part shellac to 4 parts alcohol) is applied and allowed to dry for about two hours. Next the surface is sanded with No. 6/0 sandpaper and brush filled with a very dark paste filler. In 15 or 20 minutes the filler is padded in and wiped thoroughly. The surface is then allowed to dry overnight.

Next morning the surface should be filled, padded, and wiped in the same manner as the original filling operation, and again the filler coat should dry overnight. Then a spray coat of 4½-lb. cut shellac reduced one half with denatured alcohol is applied. The shellac coat will dry thoroughly in five hours so that the surface can be sanded again, using No. 6/0 sandpaper.

After cleaning, either one or two coats of lacquer or varnish are applied, with a sufficient drying period following each coat; then the finish may be rubbed if required.

Of course, if the quality of finish does not demand double filling, this operation may be omitted; however the second filling is recommended, especially for mahogany surfaces.

An excellent finish may be obtained on mahogany furniture in the popular red-brown finish by using a suitable water stain and following this same schedule just outlined.—P.C.B.

*Preferably a modern non-grain-raising permanent stain.

Clean Up, Paint Up Committee Appointed for 1931

The National Clean Up and Paint Up Campaign Bureau, 310 E. 45th St., New York City, announces that R. A. Plumb of Detroit has accepted reappointment as Chairman of the National Clean Up and Paint Up Campaign Committee, and that acceptances of membership on the Committee also have been received from Granville M. Breinig, Kansas City; B. J. Cassady, Pittsburgh; John R. MacGregor, Chicago; and Horatio L. Wilkinson, New York. All of the members of the new committee are thoroughly acquainted with the National Clean Up and Paint Up program.

Meetings Scheduled Next Month

National Convention and Informashow of the National Association of Purchasing Agents will be held June 8-11, at Toronto, Canada. Mr. G. A. Renard, secretary; headquarters, 11 Park Ave., New York City.

Annual Meeting of the A. S. T. M. will be held at the Stevens Hotel, Chicago, June 22-26.

Nineteenth Annual Convention of American Electro-Platers Society will be held June 29-30, July 1-2, at Hotel Seneca, Rochester, N. Y. S. P. Gartland, general chairman.

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Lilly's Lacquer Refrigerator Finishing System

Not just another lacquer, but a system which adapts a fundamentally superior product to the speed of your own conveyor system, to your baking time and temperature, and delivers a finish which offers an amazingly effective resistance to all the elements of destruction which limit service and kill satisfaction.

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Lilly quality is available in Varnishes, Lacquers, Enamels, Fillers and Stains. Write us about your present or future requirements in the industrial field.

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Furniture Finishing Methods

By
BEN J. STUDER

Foreman Finisher at a large, well equipped table plant explains how modern finishing materials and appliances have shortened the finishing time, the quality remaining the same

MOST OF US can remember the time when 10 to 12 days were required to finish a piece of furniture ready for the rubbing department. In those days we stained one day and allowed the piece to dry overnight. Then we filled and again an overnight drying period followed, after which a coat of shellac and two or three coats of varnish were applied—with several days drying between the varnish coats.

Lacquers, pyroxylin fillers and sealers and fast-drying stains have paved the way for big reductions in finishing time. Modern equipment such as conveyors, spray machines and forced air-drying ovens have further reduced the time, until it is now possible to finish a piece of furniture up to the rubbing operation in two days.

Here I will briefly outline a rapid finishing schedule, using forced air drying. The first operation is to water stain* and place in kiln for 1½ hours at 110°F. After sanding, the piece is filled, cleaned and placed in another kiln for six hours at 110°F. with a relative humidity of 42%. Then the shading stain is applied and allowed to air dry 30 minutes. Next comes the sealer coat which is dried in a kiln for 60 minutes at 100°F. with a relative humidity of 42%.

Now the product is ready for the lacquer. This should be sprayed on as a "heavy wet coat," using only enough air pressure to properly break up the lacquer. The skill of the spray operator is revealed by his ability to know just when he has arrived at the correct air pressure to produce good results.

There is no general, invariable rule which may be followed concerning correct air pressure; the size of needle, kind of gun, and size of the nozzle used—these all affect the final result equally as much as the air pressure, and they must be reckoned with as factors of influence upon the amount of air pressure to be used.

The first coat of lacquer is kiln dried for two hours at 100°F. Special attention needs to be given this kiln to obtain not only a maximum circulation of air but to be sure the fume laden air is properly exhausted. All else being equal, this drying will help produce a good clear finish.

The second coat of lacquer is applied and dried similar to the

* Or use a "wateroil" or a non-grain raising penetrating stain.

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Zellac Grades Represent the Greatest Lacquer Values

Two generations of lacquer customers have known the name Zeller as synonymous with high value. Zeller has always sold with emphasis on VALUE-per-gallon, rather than price-per-gallon. It will pay you to investigate the economy of Zellac grades, no matter what type of lacquers you may require.

Have you fallen into the *price-per-gallon* habit? Then consider how much you will gain, due to their higher efficiency, when you buy Zellac grades, usually at no greater price-per-gallon. Absolutely correct for *your* needs, engineered to fit *your* work, specially formulated where requirements are special, there are Zellac grades that will definitely improve your finishing. In other words, Zellac grades *will save money for you*—cutting your production costs, eliminating production troubles, and providing a perfection of finish that will materially aid your sales. That is *value!*

Let a Zeller representative quote Zeller prices on any type of lacquer material you want—then compare by actual test. You will be amazed by the lower costs. An economy test of this kind is decidedly worth making under presentday conditions.

Attention is called to our Zellac Super Wood-Sealer, Wood Lacquers, Zelactite grades for Crystalline Finishes, Zellac Outdoor Exposure clear lacquers and lacquer enamels, and innumerable other grades for every conceivable industrial purpose.

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first coat, and the piece is ready for the rubbers.

It is possible to rub a lacquered surface after the final coat has dried for 12 hours, but I have found that a better finish is produced if the final lacquer coat air dries 24 hours before it is rubbed.

Uniform Temperature

The most important thing about the forced air-drying of wood finishes is to maintain a definite and uniform temperature in the various kilns. This temperature should not exceed 110°F. I have found that a relative humidity of 42%, at temperatures of 100° to 110°F., will dry the finish satisfactorily without causing serious fluctuation in the moisture content of the wood. Means for circulating air in all of the kilns is essential—and last but not least is the importance of supplying clean fresh air to the kilns and exhausting the fume laden air.

If the common rules of good finishing procedure are followed with the added advantage of skilled operatives, modern finishing materials and equipment, production in the finishing room is limited only by the capacity of the machine and assembly departments.

Wax Airplane Finish

Airplanes that have had their exterior finished surfaces waxed have been tested to show that the smoother surface is a factor in facilitating increases of speed and decreases in "drag"; also there is less formation of ice on waxed airplane surfaces.

The most important feature of waxed surfaces is the decrease of drag caused by "skin friction." With the application of two coats of wax on a lacquered surface a decrease of 2.381-lb. per 1000-sq.ft. of surface area results at a speed of 60-m.p.h., and at 100-m.p.h. it is believed a great decrease will be found.

The protective coating of wax also prevents [or greatly retards] the destructive action of varied and changing atmospheric conditions, and in addition prevents adherence of dirt, which in itself more than offsets the weight of the wax which is about 1¼-lb. per 1000-sq.ft. of surface. Since water has no attraction for wax, the present menace of ice formation ought to be greatly reduced through the use of wax on exposed surfaces.—J.J.B.

Dip-finishing Machine

One way of handling the dipping problem on small items similar to penholders, small handles, etc., is by means of a special machine fitted with a number of dipping spindles. The arrangement is such that the different spindles are each submerging their material at different times in the working cycle, thus allowing the operator to keep busy at all times and obtaining the maximum possible output. The material hangs from the bottom of the spindle, and as it is withdrawn from the finishing material it emerges slowly at a rate equal to the flow of the finishing material.—C. W.

Suggestion to Users of Clean Up and Paint Up Posters

The National Clean Up and Paint Up Campaign Bureau, 310 E. 45th St., New York City suggests that the users of the official 24-sheet Clean Up and Paint Up outdoor posters also use the new No. 17 street car or Window Card, which is a miniature of the large poster, in the same colors, and can be imprinted and used in street cars or in store windows, as a logical publicity tie-up.

Don't be fooled

by a sharp pencil!

Look beyond the purchase price when you buy finishing materials. "Sharp pencil" buying — *Price* buying — may save you a few dollars while the material is still in the containers — but a "bargain" in the container is often an *Extravagance* on the job.

The *Purchase* price of Opex enamels and lacquers may be a little higher—but shop records prove that Opex actually *Costs Less On the Job.* Important, too, Opex finishes help to build goodwill for your product. They retain their original freshness and beauty long after finishes of lesser quality have deteriorated.

It will pay you to prove these facts for yourself by a trial of Opex lacquers or enamels. To make such a test easy for you, we gladly offer the services of a trained staff of Sherwin-Williams finishing specialists. These men will demonstrate how Opex can be used to produce *Better* jobs at *Lower* per unit cost. Their services are offered without cost or obligation to you. Please address The Sherwin-Williams Co., Dept. 708, Cleveland, O.

SHERWIN-WILLIAMS
Industrial Finishes

Painting and Finishing Boats

By
S. CURTIS

Second installment of article which discloses customary practices in the cleaning, painting and finishing of yachts, motor boats, speed boats, work boats . . . what equipment, materials, methods and colors are employed in this important protective and decorative painting

ANY EXPERIENCED painter knows that before beginning to paint, the main thing is to get the surface smooth. Only a smooth surface will present a good finish satisfactorily. Various equipment and methods are in use for securing this smoothness, among which are portable machines—chiefly sanding machines, some of which are driven electrically while others are propelled by compressed air.

These are usually connected by flexible extensions to power lines in the shop. Blowtorches also are in use. In fact it is not an uncommon sight to see the painter working with a blowtorch in one hand and scraper in another, cleaning and smoothing the surface. On the smaller boats, particularly yachts of from 50 to 150-ft. in length, paint remover has been found satisfactory, especially where there are not many coats of paint to clean off.

It is true that in some cases the fresh paint is put on over the old painted surface, but this is seldom satisfactory, even on work boats, as it produces a very cheapening effect on the appearance of the boat. The paint remover is applied by brush and is later scrapped off in much the same manner as the paint is scraped after being burned off with a blowtorch.

The modern painter is usually instructed what to do in the way of number of coats of paint. However, when he is on the job, he must watch with considerable shrewdness the thinning process, in order to avoid streaks and differences of tint or hue or shade in his work.

Protection; Decoration

Any variation of shade is very noticeable in boats, therefore they must be painted very carefully if a real good looking job is to be turned out. In addition to its decorative effect, the protective coating of paint prevents "worms" from eating into the boat and causing tremendous damage—often resulting in the necessity of almost entirely replanking a boat so affected. This is just as true of boats that are in salt water as those that are in fresh water. The danger of worms is also another reason why nothing but the very best grades of paints are satis-

The *One Piece Steel* Head
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reduces the breakage hazard to ZERO!

Cast iron material container heads don't break under normal usage. But, accidents will happen in the best of regulated finishing departments. And, a material container with a cracked head is just about the most useless piece of equipment a production manager has to put up with.

Binks Material Container Heads are pressed from one piece of steel. They're stronger than cast iron, and, of course, they just can't break. And, that is only one advantage of Binks Material Containers. There's a complete range of sizes from a few gallons up. Write for catalog which gives all the information you need to decide on your requirements.

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factory for boat painting jobs.

Colors have become more noticeable among yachts and commercial boats of late. The average yacht uses the red-copper water line, green bouy top, and white or mahogany finish on the sides and deck house space, or both. Any brilliancy of color in yacht painting has not yet passed the "faddist" stage, but some are being turned out. Tug boats generally have red for deck houses, black to the waterline and then red copper. Other commercial boats vary from the colors of their company to gray houses, black sides and red water line, or to green houses, black sides and red water line.

Above the decks of yachts, gloss, semi-flat or flat white may be used, although the modern trend is to the mahogany finish—and this trend means work for the painter. On exterior jobs finished in mahogany a dye is used followed by several coats of mahogany stain or varnish.

Mahogany Finish

Not all of the yacht work consists of painting exteriors; interiors must be considered too, and really this work consumes more time than outside painting. Frequently the larger and finer yachts have several staterooms, in which the doors and trim are in mahogany. In the natural mahogany finish, a transparent paste filler is applied. Just enough color is added to this filler to prevent the pores of the wood from appearing white. After wiping off the filler, the surface is allowed to dry about 12 hours; then it is given a coat of shellac followed by two (or more according to specifications) coats of varnish.

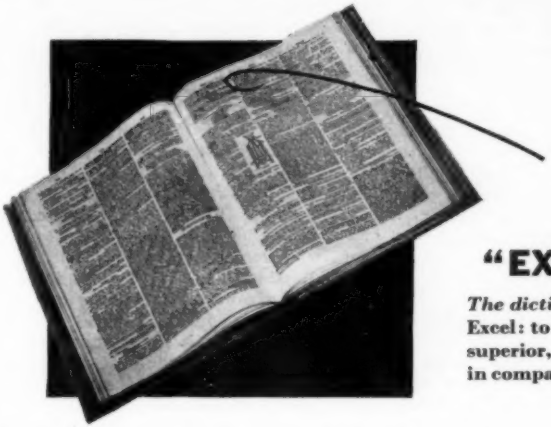
In finishing mahogany exteriors, the same procedure is followed except a thinned varnish coat is substituted for the shellac mentioned above. This is done to prevent the finish from turning white when subjected to water. Even though the shellac is protected by varnish coats, where it is continuously subjected to excessive moisture it has a tendency to take on a bluish white cast.

Small Boat Jobs

The popularity of the outboard motor, with the attendant deluging of the boating market with all kinds and descriptions of outboard motor boats, has caused the painting of small boats to gain more than their share of attention recently. As many of the outboard boats are used for racing, their owners consider it absolutely necessary that the boats be painted in such a way as to attract attention.

The outboard-motor speed-boat may be in all mahogany finish with buff effect on a canvas deck, or the deck may also be mahogany. Some of the boats in this class have mahogany sides with canvas decks painted silver, blue, or green, the latter being very popular because of its value in relieving eye strain from the sun's glare on the water. The finish is applied to the bottoms of these racing boats with unusual care, for the surface and the finish as well as the design are planned to assist the "slipping" qualities of the boat. These boats have been and will continue popular at regattas.

Another boat in which the painting is very simple, although none the less interesting, is the row skiff. The old row boats that were propelled about the harbor by oars —with groans and much sweating —now have large outboard motors to hurry them along their way. These boats are generally painted white, and the same care is used



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You can trust the *users* of a product to know how good it is and, when they buy more of that product than of any other, you can be pretty sure that they are right in their judgment.

The fact is that Lingerwett definitely *excels* as a remover of paint, varnish, enamel, shellac, and lacquer whether from wood, metal or any painted surface.

Lingerwett is not just another remover, nor merely just a little better. It is noticeably superior. Count the number of coats it goes through . . . . . 5, 10, 15 coats or more. Count the number of applications . . . rarely more than one. Check the speed . . . how much more quickly Lingerwett works.

And — most important of all — notice how, instead of a gummy, clinging mess that is so exasperating to handle, Lingerwett reduces the surface to a soft, loose sludge that is easily wiped out.

Just try Lingerwett once, that's all you need to do to realize that it's the remover you will use thereafter. We are so sure of Lingerwett and what you will think of it that we can afford to send you a generous size sample can entirely free. The coupon is for your convenience.

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in the painting as in other boats because buyers look with ill favor upon anything that pertains to carelessness in manufacture or finish.

Naturally the success of the boat painting job is dependent not only upon the quality of the material and the skill of the workmen, but also upon the equipment with which the painter works. Spray equipment is used to considerable extent, but the day of the hand brush painter in the boat yard is far from gone. Much attention is given to brushes by the boat painter, for they are his tools. Badger hair brushes are considered the very best, with camel hair brushes also in popular demand.

Portable Spray Equipment

Undoubtedly the small portable spray outfits now on the market are highly necessary and useful. However it will prove advantageous to the prospective purchaser to study his requirements well before deciding on the particular size and type of equipment to buy.

There are certain definite limits to the performance of any equipment, and the portable spray is no exception. Obviously, the small outfit equipped with ⅛-h.p. motor, directly connected to a rotary compressor and suction feed cup, and a spray gun with limited adjustments, will not produce the same results that can be obtained with standard spray equipment.

If only a small amount of ordinary painting, finishing or decorating is to be done this small unit will give excellent results—if the viscosity of the material is correctly adapted to the available air pressure. This point should be given thought and attention, because if the material is too heavy, the maximum air pressure, (approximately 20-lbs. per sq. in.) developed by the rotary compressor is not sufficient to break up the liquid properly. On the other hand, if the paint is reduced too much, greater quantities of the material will be fed through the gun, which will result in spattering. In either case, a quality finish becomes impossible.

Where exceptionally high grade finishing is to be performed, strictly decorative in nature, the larger portable spray outfit equipped with ¼-h.p. motor and a compressor capable of developing approximately 50-lbs. air pressure are recommended.

This larger type may be equipped with a pressure-feed gun having fluid needle adjustments whereby the quantity of material fed through the gun can be controlled. Obviously this type of equipment, if intelligently used is capable of producing better results, and embraces a range of uses far greater in proportion than the difference in cost between this and the smallest power unit.

Of course, there are larger types of portable spray outfits having various refinements that promote greater efficiency and ease of operation. The size and type of equipment to install depends entirely on the quantity and size of product to be finished and the results desired.

A modern system of heating employs automatic apparatus to deliver only sufficient steam to maintain a constant temperature of approximately 70° F., effecting considerable saving in fuel consumption when weather conditions do not place full demand upon the heating plant.

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Cleaning-Handling Baking & Polishing

Material and Process Specifications

Calling attention to recent developments and new trends in the specification of cleaning and finishing materials and processes, whereby definite results are actually predetermined and closely controlled

By R. C. HARMON

IN ABOUT 1929 there came into the industry that produces porcelain enameled stoves, ranges, refrigerators and cooking utensils for the first time the use of continuous porcelain enameling furnaces and supplementary equipment such as spraying booths, dryers, etc.

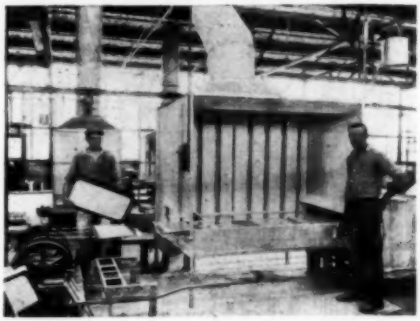
The continuous furnace as well as the current period of depression has brought a newer era in which the industry is now existing, and this is one of materials specifications and also process specifications.

The materials specifications are being supplied as well as fulfilled by concerns furnishing frits, or the porcelain enameling material, the enameling steel, ingredient chemicals and other materials to the individual porcelain enameling plants.

This in turn makes it possible for the individual plant to specify process standards for its shop operations. These call for standardized thickness in which the enamel is applied to the steel, standardized temperatures and acid temperatures at which the shapes are cleaned, standardized methods for hanging, upon the continuous furnace chain, the parts that are to be enameled in the furnaces, set

furnace temperature and the like.

Every manufacturer of finishing materials, as well as finishes in materials other than porcelain enamel, is familiar with process specifications and can therefore appreciate all the major and minor specifications for processing that have been set up in the porcelain enameling industry.

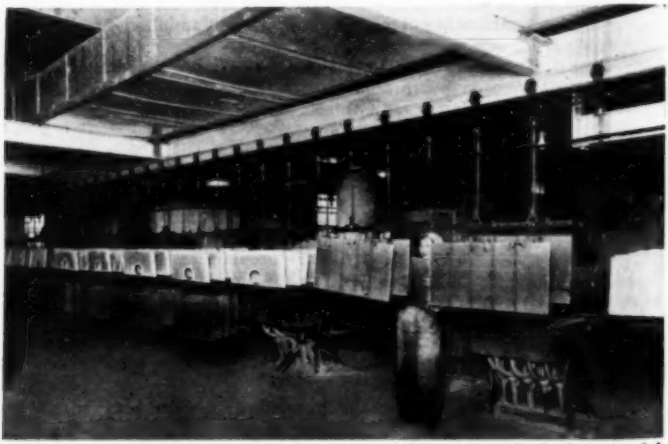


In the spray room where standard thickness coatings are applied with latest equipment and facilities.

Firms that have been most forward-coming in doing this in their porcelain enameling departments are Frigidaire, General Electric, Westinghouse, Gibson Refrigerator, Wrought Iron Range Co., and many others.

In plants such as these, I understand the method is to have a general process inspector who periodically inspects each department, reporting to the head of the firm or the department any violations, using what is termed, a violation slip, from process specifications. The head then calls a meeting at which the various violation reports are freely discussed with the proper department heads in the enameling plant.

This sort of procedure is of course not new to other industries.



Notice how carefully the parts to be porcelain enameled are hung by hooks suspended from overhead carrier.

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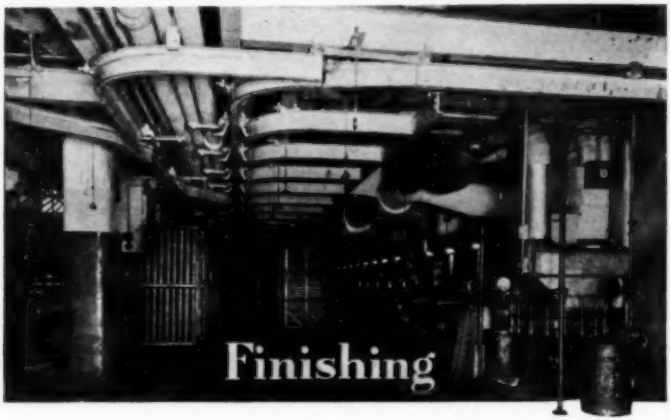


Hand Telephone Sets

By
P. C. BARDIN

Explaining in detail how telephone parts are treated, cleaned, finished, baked and handled . . . as observed during a visit to the Hawthorne Works (at Chicago) of the Western Electric Co., Inc.

THERE ARE probably very few finished articles in common use that receive as severe wear over so long a period of time as the telephone instrument. Perspiration from the hands is an ever present enemy to all finishes, but in the case of the hand telephone set it presents a real problem.

There are four major materials used in the manufacture of the telephone on which organic finishes are applied—namely, molded phenol plastic, brass, steel and die-cast aluminum alloy. Standard finishes used at the present time are black baked japan, and lacquers pigmented to produce colors corresponding to old brass, statuary bronze, oxidized silver, medium gold, dark gold, ivory and gray.

The illustration at top of page shows overhead trolley lines and (at right) spray booths where parts are spray finished.

Preparation of the Metal

There is no middle course in the finishing of the telephone; the finish must be as nearly perfect as is possible to make it. To meet this rigid requirement the metal surface must be perfectly smooth, and extra operations are employed which are seldom used in the average metal finishing shedule.

The first step is the removal of any oil or grease with which the parts have become contaminated during fabrication, irrespective of

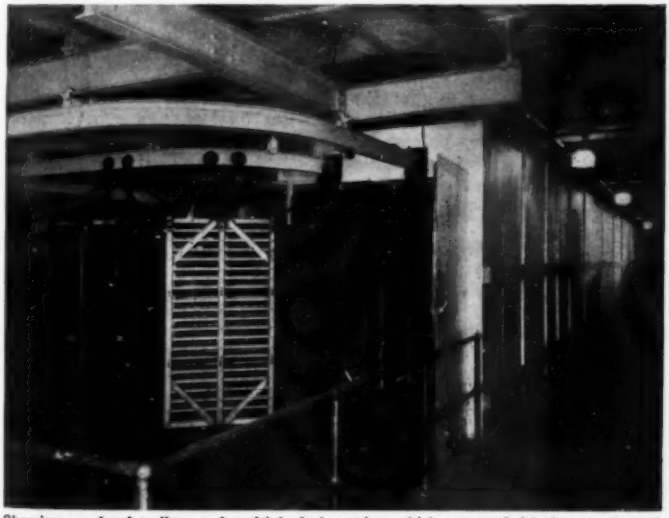
material used or of the finish to be applied. The parts then proceed directly to the cleaning and polishing room where the brass and die-cast aluminum parts are polished on cloth wheels, using No. 100 and 120 emery face. Steel parts are polished on cloth wheels using No. 60 and 100 emery face. This removes any surface irregularities. After inspection all parts are sandblasted by being exposed to a stream of fine grade sand which finishes the smoothing and produces a surface to which the finish will adhere. This in turn is followed by a blow-off operation.

The die-cast aluminum parts and the brass parts are then placed on the finish line, but the steel parts proceed to the phosphate room where they are given an iron phosphate finish which acts as a rust-resisting coating under the final finish. The phosphated parts are scratch-brushed on a power wheel, inspected and sent to the finish line.

Standard Black Finish

On metal mounting parts the standard black finish consists of black baked japan. For molded handset parts, black phenol plastic compound is employed and, except for a slight polishing operation used to remove the "fin" produced in the moulding operation, the natural moulded surface of the black phenol plastic is retained.

In the application of the black japan finish to metal parts, the same general procedure is followed for each of the several piece parts. Telephone bases enter the japan department on a monorail conveyor and are carried to an automatic spray machine where the first coat of japan is applied. This machine revolves the bases



Showing overhead trolleys and multiple-deck carriers which convey finished parts through baking oven.

in an upright position as they pass through the spray from oscillating spray guns. Immediately following this first application, the bases are removed from the conveyor spray machine and placed in tray carriers that operate on the monorail conveyor.

The loaded carriers are transported into the vestibule or anteroom of the baking oven where they remain until five carriers have accumulated. This oven accommodates 30 carriers, or six sets of five carriers each, moving at the rate of 15 minutes per set. By this system, one set of five carriers enters the oven as another set of baked parts emerges, allowing a baking period of 1½ hours for all parts. The oven is operated at 420° to 440° F., and has equipment that produces a change of air in the oven 50 times per hour.

After baking, the carriers leave the oven on the monorail conveyor, cooling as they travel back to the automatic spray machine for the second coat of japan which is applied and baked in the same manner as before.

Cradle parts (which hold the instrument when not in use) follow the same general procedure, but are coated in a special spray machine.

To determine the extent of cure, representative samples are removed from the carriers at frequent intervals and immersed in a saturated solution of carbolic acid in water at 70° to 74° F. Brass parts are immersed for two hours and the steel and die cast parts for one hour. If the finish resists peeling, it is satisfactory.

All parts enter the inspection line after the second japan coating has been baked; rejects are returned to be reworked, while acceptable parts go to the stock room to be requisitioned by the assembly division.

Colored Lacquer on Metal

Two methods of finishing are employed in producing the colored telephone handsets—a baked primer and lacquer system for the metal mounting parts, and an all-lacquer system for the phenol plastic handset parts.

Those parts that are to receive a colored lacquer finish of either old brass, statuary bronze, medium gold, dark gold or oxidized silver, are first given two coats of black baked japan in the manner just described; then lightly sand-blasted to remove the glazed surface of the japan finish. After being blown off, they receive a cleaning in benzine followed by two spray coats of the colored lacquer, allowing one hour between coats and two hours after the second coat for drying.

The next step is highlighting or shading with a lacquer of different color. The highlighting coat is permitted to dry for one hour, after which the parts proceed to the final coating booths. Here two coats of special perspiration-resistant lacquer are applied, again allowing one hour between coats and two hours after the final coat for drying, after which they are rubbed with pumice and water.

Parts that are to receive an ivory or gray finish are given two spray coats of a light-colored baked oil-base primer, instead of the black baked japan. The shading coat is omitted; otherwise the same general procedure is followed as for the other colors.

Lacquer on Phenol Plastic

Phenol plastic parts are prepared for finishing by sandblasting. Following a blow-off oper-

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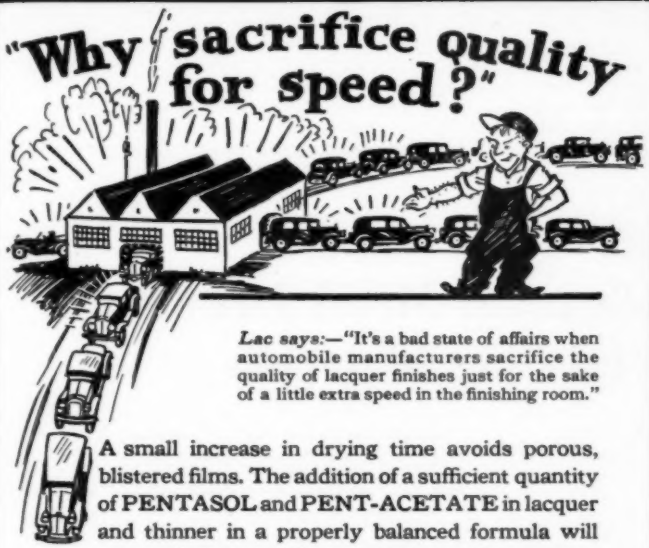

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ation and inspection they are washed in benzine or carbon tetrachloride to remove all oil and grease that may have accumulated from handling. Ready now for the finishing, the parts are sprayed with a coat of lacquer primer, and allowed to dry for one hour before spraying with pigmented lacquer surfacer. After again drying for two hours, the parts are sanded with No. 5/0 sandpaper, cleaned and sprayed with two coats of colored lacquer, allowing the usual intervening drying periods. This is followed by shading as required. Finally, two coats of perspiration-resistant lacquer are applied, followed, as in the case of colored lacquer on metal, by rubbing with pumice and water.

Cleaning Metal Drums of Finishing Materials

By
JAS. COLLIER

Superintendent of S. C. Johnson & Son Co., Racine, Wisc., manufacturers of wax and other finishing materials, collaborating with A. C. Nielsen Co.,* engineers, explains method of cleaning drums, possible savings and production

CLEANING STEEL drums that have been used as containers for finishing materials is a problem which confronts every manufacturer of these materials, and a great many users too. Varnish, lacquer, or wax, hardened after several months standing is not easily cleaned from a metal surface, and the inaccessibility of the drum interior does not aid in the operation. Obviously, all dried material must be removed from the inner walls of the drum before it can be refilled with the same or other materials.

Due to the fact that we have from 15 to 20 drums to clean daily, cleaning equipment is necessary. Our present equipment consists of a vat 6-ft. square with a capacity of 130 gallons, and equipped with steam coils for heating the solution; also a small motor-driven pump and piping system used for flushing out the drums, and a tumbling machine.

Method of Cleaning

The cleaning operation is as follows: First we place the drum, with the bung hole down, on two supports laid across the top of the vat. The cleaning solution (70-lbs. of cleaner to 130-gal. water) is heated to the boiling point and then injected under pressure into the bung hole of the drum. This solution washes the inner walls of the drum thoroughly, removing all scaly particles, and drains back through the bung hole into the vat to be used again. Of course the pump intake is protected against solid particles in the so-

*Nielsen Certified Performance Surveys, 4450 Ravenswood Ave., Chicago, Ill.

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lution by a suitable screen or filter. This preliminary cleaning requires 15 minutes.

For the final cleaning, drums are mounted on a tumbling machine. A small quantity of the cleaning solution and a short length of steel chain are placed inside the drum. After tumbling for 15 minutes the drums are rinsed thoroughly with clear water, drained and allowed to dry. The drums are now clean and ready to be refilled.

Cleaning Solutions

Caustic soda was formerly used as a cleaning agent. Due to the highly caustic properties of this material great care was necessary in handling the cleaning solution to prevent serious burns. This naturally retarded the operation, making it possible to clean only about 14 drums a day. The caustic loosened the dried material inside the drums, but did not dissolve it, which made it necessary to spend more time in tumbling. We found this applied especially to used varnish drums. While using this solution it was necessary to overhaul the equipment four times a year due to the corrosive action of this agent.

The commercial cleaner now in use dissolves the dried material inside the drums more readily; it is not highly caustic, therefore requires less care in handling, and it speeds up the cleaning operation. Our production in cleaned drums has increased from 14 to 20 drums per day with the same equipment and same operator. Owing to the fact that this commercial cleaner is not a corrosive agent, the equipment requires overhauling only once a year. This represents a definite saving.

New Lacquer Developments

(Continued from page 13)

their solvents readily. They also contain metallic soaps, the most common of which are zinc stearate and zinc palmitate, which aid in the sanding property. When properly made they can be sanded to an extremely smooth surface without any tendency to gum the sandpaper. Lacquer sealers, being of nitrocellulose base, are quite durable undercoaters and, unlike certain shellacs and their substitutes, do not become extremely brittle with age.

There are two common types of lacquer sealers, those which derive their sanding properties from high ratios of nitrocellulose to gum, and those which utilize the quick drying properties of some of the new synthetic resins. The latter type makes possible the production of extremely high-bodied sanding sealers.

More recent than the use of sealers as undercoats for lacquer is their use as undercoats for varnish. The object of the sealer in this case is not so much to build body as it is to seal the pores of the wood to prevent absorption of the varnish. For this reason good sealers can be made for this purpose at a very low cost.

Clear Lacquers for Outside

Before the advent of synthetic resins in the lacquer field it was considered impossible to make a lacquer that would withstand outside exposure without the use of pigments. Clear lacquers made from the natural resins or ester gum, and exposed during the summer months were apt to be destroyed completely in as short a time as 48 hours. By the use of some of the new synthetic resins it is now possible to produce clear

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lacquers which are quite durable. Some have been exposed for considerably over a year on both wood and metal and are still in good condition. This development holds the interest of the automobile refinishing trade which has a need for such a finish on used cars being reconditioned. A finish of this type is also finding increasing outlets in the sign industry. A modification of this type of finish has proven quite satisfactory on the wooden parts of automobile bodies as well as for many other uses too numerous to mention.

Another development, more recent than any heretofore mentioned, is a new synthetic resin which is extremely flexible. The possibilities of this resin as a lacquer resin are very great, particularly for special finishes and undercoats. Its newness, however, makes it rather hard to predict just what the ultimate applications will be.

There have been so many developments recently in the formulation of clear lacquers that there is no doubt that some have been overlooked. Suffice it to say, however, that the lacquer industry is advancing by leaps and bounds and the wise purchasing agent will have his eyes and ears open at all times.

Some of the developments in the formulation of colored lacquers will be discussed at a later date.

Lacquers on Ceramic Products

The ceramic industry, one of the industries that was thought to be among the last to use lacquer, has now adopted the use of lacquer enamels on its products. Ceramic manufacturers are now coating flower pots, various mouldings, statuary, and vases in lacquer enamels. The use of lacquer on these products is chiefly for appearance; however, they are preferable because of their rapid drying qualities. Ceramic products finished in lacquer are attractive and readily salable.

The usual finishing schedule is as follows:

First: Spray a wet coat of lacquer undercoat (a pigmented surfacer) onto the clay mould or plaster of Paris statuary, using controlled air pressure. It is quite essential that a wet coat of surfacer be applied, because the plaster of Paris is porous and really should have a smooth surface (without sanding) on which the subsequent lacquer enamel coats can be applied. Allow surfacer to dry at least 30 minutes.

Second: After the surfacer has thoroughly air dried, apply lacquer enamels directly over the undercoater. These enamels are usually of a concentrated color, and require about 25% reduction for spray application. This facilitates solid coverage in one spray application, at about 25 to 35-lbs. air pressure, which should be sufficient.

A small touch-up gun may be used for "cutting in" purposes on objects where there are projections, as in the case of statues. The final finish should have a natural lacquer enamel luster. However, the amount of luster is due to the kind and make of enamel used.

On some of the finer pieces of ceramics, a clear lacquer is sometimes sprayed over the lacquer enamel. A clear lacquer is generally used on statuary, while a clear varnish is used on the numerous gnomes that are often

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present on the average miniature golf course.—M. C. Roberts.

Plant Maintenance Painting

A paint inspection of the plant of any going concern at this time may save many dollars in maintenance expense. To really be of value this inspection should be made of the whole factory, starting from the outside and including roofs, window frames, sash, passageways, doors, tanks, guttering, fire escapes, pipe lines, fire plug hydrants, water pails and all exposed surfaces. A well painted plant is inspirational to its employes and gives others a better impression of the concern.

Lack of paint on exposed surfaces will permit rapid decay, and make later repairs costly; in a few years' time this may mean a substantial loss and perhaps a complete shut down of the plant for major repairing or rebuilding operations.

Neglected metal roofs rust and permit water to leak through. Rusty places in the metal roof should be well brushed with a steel brush and then coated with metallic or asphalt roof paint. On outside wall siding one must look for worn paint and for loose chalking paint that allows moisture to penetrate and damage the wood. If the walls of the building are of wood siding, sandpaper all loose places and apply two coats of good white lead paint.

Window frames and sash are subjected to hard wear and severe weather conditions, causing the putty around the glass to become loose and fall away. When repairing, remove old putty and give the wood a coat of oil or paint. If this is not done, the dry porous wood will absorb the oil in the new putty and cause it to crumble and fall out again soon after it dries. For this work I prefer good white lead putty, and after the putty is dry I recommend coating it with at least two coats of white lead or mixed paint.

Exterior iron and steel work such as fire escapes, ladders, etc., soon become rusty if the surfaces are not kept coated with suitable paint. When refinishing such pieces, scrape off all rust, and coat with red lead, followed by a final coat of outside paint suitable for such metal work.

Fire plug hydrants can be treated first with red lead, but the final coat should be of a more brilliant color.

The interior, as well as the exterior of the plant should be well kept. While less decay occurs on the inside, the interior painted surfaces are subjected to more severe wear and become covered with more dust and dirt. Walls and ceilings should be of white or some light color with a border about 5-ft. high of gray or a dark color around the side walls.

There are always capable men around the plant who can do this work in slack seasons. A cost record should be kept of each painting operation, the amount of paint and the kind of paint used. This record will be useful when the next maintenance paint work is planned, to determine how well different coatings have worn and what condition they are in after a period of wear.—J. K. Cooper.

Important points to be brought out in the census of manufactures to be taken in 1930 will include the migration of industry and data on idle power equipment.

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Questions and Answers

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer any further comments or recommendations pertinent to subjects mentioned

Plastic Wood for Repairs Holds Color

Replying to the inquiry in February issue, page 57, "Lacquer Bleaches Putty," the usual way of coloring the various plastic woods and crack fillers is such that by the passing off of the solvent the coloring matter seems to be destroyed. I have found only one plastic wood composition (name on request) that will hold its color. This material dries out in practically the same color as it is in the can.

In using this composition material I take the color nearest to that desired, fill in the fracture, and stain it with the same color stain I use on the wood. If a water stain is being used, I make a stain the same strength, with alcohol as the solvent, or with alcohol and water, half and half. With this composition and the stain, the fracture can be filled so that a person unacquainted with the work in hand, could find the damage.—C. N. Phelps.

Paint on Ceiling Darkens

We are using a ready-mixed cream-colored paint on the ceiling of a bakery in which the temperature is constantly 125°F. We use turpentine for thinning, and spray this paint on the ceiling, which is concrete. The paint doesn't peel nor crack, but it seems to be turning dark brown. With this change in color, we are compelled to repaint the ceiling continually. The lamp shades we use have baked paint on them, and they also darken. Have you any recommendations or suggestions to offer as to what causes this, and how to correct it?—R. J. A.

It is unfortunate that you have not stated whether you are using a ready-mixed house paint or flat wall paint, for if I knew, it might be easier to tell you more specifically what is causing the trouble.

If you are using ready-mixed house paint, there might be a reaction between the lead in the paint and some possible sulphur fumes in the air caused by the fuel used to heat the ovens, or from what is baking. This reaction between hydrogen sulfide and white lead causes the lead to turn dark, because it forms lead sulfide, which is black. On the other hand, if you are using a flat wall paint, this would not occur, since flat wall paint does not contain white lead.

Then, there are two other possible causes for the apparent darkening. It is possible that the ceiling was once coated with something that is now bleeding through the coats of paint. I believe, that if the bakery had not been painted for some time while in use, a lot of grease would accumulate on

the ceiling, and this might even bleed through coats of paint. The other possible cause is that the dampness and heat would provoke the growth of mildew, making the paint look dingy and brown.

I suggest that you endeavor to find out the exact cause of this darkening. If you are using outside house paint, it would be well to use flat wall paint instead. But if flat wall paint is already being used, then the cause is probably one that I have named—either, grease bleeding through the paint, or mildew.

For bleeding, I suggest applying a coat of aluminum paint as a remedy. And for mildew, it will be necessary to give the ceiling some kind of a poisonous wash to kill the mildew. Most painters have had some experience with mildew, and have prepared some kind of formula to use in such a case.—Clarence Steinhoff.

Finishing Basswood

I am interested in learning of a less expensive method for finishing basswood than I am now employing. At present I am finishing this wood by first sanding the surface smooth and then applying a spray coat of sealer or shellac, and two coats of lacquer—sanding after the shellac coat and the first lacquer coat. After the second application of lacquer, the surface is rubbed and polished. We are using a pink, red, and light green lacquer, and the grain of the wood is hard to cover. Could you suggest any other method of finishing basswood with less work?—J.E.J.

I suggest that you fill the smoothly sanded wood surface with one of the quick drying lacquer fillers, brushing it on the

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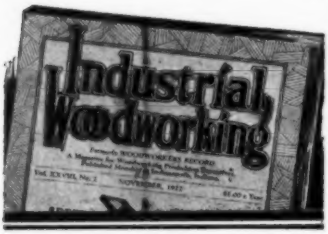

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surface, cleaning it off, and allowing it to dry for about four hours. (An oil filler may be used, but will require more drying time.) Then apply two spray coats of lacquer, allowing the first coat suitable drying time before sanding; rub and polish the final coat.

A light colored filler may be used. The use of filler builds up the surface, fills the pores, and permits the lacquer coats to remain on top of the surface instead of sinking down into the pores. This method of finishing eliminates one sealer coat and one sanding operation.

Colored lacquers do not contain sufficient pigment to cover slight irregularities of the surface, hence the grain of the wood shows through the final lacquer coat. Using a filler will fill and level up these irregularities, producing a smooth, uniform surface for the succeeding coats.—P. C. B.

To Bleach Mahogany Stain

I would like a formula for a bleaching compound strong enough to bleach wood stained red mahogany and brown mahogany. I have tried several mahogany bleaching compounds, and they work satisfactorily on wood in the white, but do not seem to be strong enough to bleach red and brown mahogany stains from the wood. —R. D.

To bleach red and brown mahogany stains out of the wood, I suggest that you try first applying a solution of permanganate of potash mixed in the proportion of 2-oz. to a gallon of water. Sponge this onto the stained wood and let it stand until dry. Then take about a 2-oz. solution of oxalic acid or sodium hyposulphite and

wash the permanganate of potash off. This should bleach and remove the stain, although it is possible that results will depend considerably upon the kind and type of stain that has been used.

There is one precautionary point that must be borne in mind before success can be obtained with any kind of bleaching material on stains, and that is that all finishing coats over the stain must be removed. If there is the slightest film of shellac, lacquer, or varnish on top of the stain, it will interfere with and perhaps prevent the necessary chemical action, and good results will not be secured. More than one application of the two different solutions may be necessary to completely bleach the stain.

After the color has been bleached out, wash the chemicals off with clear water and allow the wood to dry thoroughly; then sand, restain and refinish.—R. L. Masterson.

Test for Lacquer Thinners

Is there a method for testing lacquer thinners to find out which one will bloom or blush more than others, without actually applying them to the surface to be finished?—L. J. G.

I suggest that you take a clear lacquer or a colored lacquer that is known to be of uniform quality and mix a considerable quantity of the lacquer thinner in question with this lacquer. At the same time mix exactly the same amount of lacquer with another lacquer thinner that has given satisfactory results previously. Pour these two mixtures upon glass plates placed along side of each other and watch them carefully as the

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lacquer dries to see which one will show the greatest tendency toward blushing.

This blushing tendency can be accentuated by blowing your breath on the undried surface and watching to see how completely the blush clears up when the lacquer is finally dry. Of course, care must be taken to see that one sample is not given preference over the other one when the extra humid atmosphere in the form of breath is blown on the undried surface.

This is a rather crude test, it is true, but it will plainly indicate whether one lacquer reducer is as good as another from the blushing standpoint alone.—C. F. Merrifield.

Walnut and Mahogany Radio Cabinets

Could you recommend some successful method of finishing mahogany and walnut gramophone and radio cabinets? I am interested in the semi-flat process.—J.W.W., Barcelona, Spain.

I suggest the following method of finishing these cabinets: First spray a water-oil stain of the desired color and allow the cabinets to dry overnight. Then spray on a very thin lacquer sealer coat to seal the color in the stain coat and make filling easier. Allow the sealer coat to dry about four hours, and sand, using No. 5/0 sandpaper. Next, the surfaces should be filled by hand. It is possible to use a quick drying lacquer filler which will dry in about four hours; the method of filling with this material is the same as with an oil filler.

After the filler is thoroughly dry, a lacquer shading stain is applied

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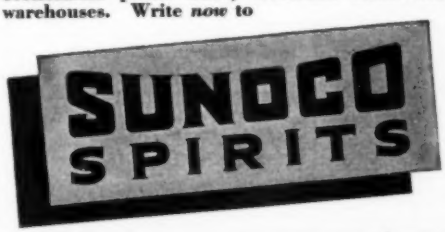

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to the cabinet with a shading gun to uniform the color. After the shading stain is dry, spray on a coat of lacquer sealer and allow to dry about four hours; then sand with No. 5/0 sandpaper. Spray a final coat of flat lacquer over the entire cabinet, and when dry, rub the top of the cabinet only.

If you wish to rub the entire cabinet the final lacquer coat should be gloss.

This schedule will produce an excellent finish if it is followed closely and if high grade finishing materials are used. The only hand operation is filling, which really can be done by the spray method, but spray application is not recommended for a high grade finish.—P. C. B.

Cleaning Stained Fabrics

Referring to the question and answer about cleaning the light colored fabric on sport model automobiles, pages 61 & 62 of February issue, I do not know of a preparation on market at this time, but the following may be used very effectively:

To clean grease spots, stains, etc., without removing color from fabric, apply with sponge liberal quantity of "King Kleener" (Mfr's. name on request). Dirt and grease will immediately be dissolved; saturate and rub with small hand brush and rub dry with clean cloth. About four hours time will suffice for odor to disappear. I have used above system on fabric tire covers with success. It will appear, however, after the fabric drys that the color has been bleached, but this has not been caused by cleaning; the true condition is that the sun has actually bleached the color.

To bleach fabric such as is men-

tioned, follow this process: Saturate top with liberal quantity of oxalic acid solution made up in the proportion of ½-lb. of oxalic acid to one gallon of water. Rub into fabric with small hand brush and apply two to three applications, brushing vigorously to clean and impregnate fabric thoroughly. Allow an hour to elapse for action to complete itself, then neutralize with the following: Dissolve 1-lb. sodium carbonate in one gallon of warm water.

Be sure to saturate bleached fabric with liberal quantity of soda solution to completely neutralize acid remaining in fabric. After two or three applications wash thoroughly with warm water and allow to dry. This process will remove all color, and the fabric should dry out with a grayish white color. —R. E. Hauschild.

Metal in Mahogany Finish

We are interested in the full process of finishing metal in imitation of mahogany, walnut, and oak.—M. G., Havana, Cuba.

I assume that the question refers to a finish other than porcelain or vitreous enamel, and that the metal referred to is approximately 20-gauge steel. I mention this in the first instance because the process, as applied to vitreous finishes, is necessarily different from oil and lacquer finishes, and in the second instance because in all types of finishes the metal-cleaning operations on sheet steel and cast iron are different.

First the metal surface to be finished must be thoroughly cleaned so that it is absolutely

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free of grease, oil, rust and any foreign matter. This is generally accomplished by pickling—dipping the parts successively in a chemical wash, cold water, acid solution (generally, muriatic), cold water, neutralizer (alkali), boiling water to facilitate drying, and then drying in an oven or gas vat.

Another method of metal cleaning, sometimes used where only oil or grease must be removed from the surface (no rust), is to subject the parts to heat of about 1200° F. for 10 minutes; then wipe clean. Still another method of cleaning parts, where rust is not encountered, is to wash the surfaces with a rag saturated in benzine, gasoline or mineral spirits. Whatever method is used, the surface must be clean.

Finishing procedure follows: Spray coat of oil primer; bake in oven approximately 90 minutes at 225° F.; glaze with putty—using a flexible knife—to cover file marks, slight depressions in surface, or rough spots. Allow putty glaze to dry; sand with No. 150 sandpaper unless you use a special putty which requires no sanding; wipe and blow clean; spray ground coat (oil base), the color of which should conform with the color of the wood to be imitated. Bake ground coat the same as primer; sand with No. 150 sandpaper, tack rag and blow clean. Next apply graining coat as explained later. Bake the graining coat approximately 90 minutes at 220° F. Tack rag and follow with two spray coats of gloss lacquer, allowing time to dry after each coat; then rub with pumice and water, and polish.

Graining is done by the rubber-roll method. Equipment consists of a copper plate which bears the grain of the wood to be imitated, or a treated wood panel having a face veneer of the particular species desired. The entire surface of the plate or panel is inked by the squeegee method and a clean, soft rubber or composition roll is rolled over the inked surface. This roll picks up the inked figure design from the plate or panel. The roll is then rolled over the metal part to be finished, transferring the grain figure from the rubber surface to the baked ground coat. Rolls should be thoroughly cleaned in benzine after each application to prevent distortion of the grain figure on the next part.

The process described here is intended for a very high grade of work from the standpoint of durability of finish. Some manufacturers omit the ground coat entirely, using the primer as a ground color for the graining. Others omit putty glazing and some spray only one coat of gloss lacquer after graining and dispense with rubbing and polishing. Both baking time and temperatures will vary with the type of material used, but baking of undercoats is absolutely essential for quality work. However if the sequence of operations are followed as outlined and suitable finishing materials are used, the excellence of finish will depend solely on the skill of the workmen.—C. J. Mitchell.

Film-O-Graph Announced

The Parks Equipment Co., Bourse Bldg., Philadelphia, Pa., has recently designed and placed on the market an apparatus which will not only apply the paint, varnish or printer's ink film of uniform thickness, but which will also predetermine its thickness.

New Materials and Equipment

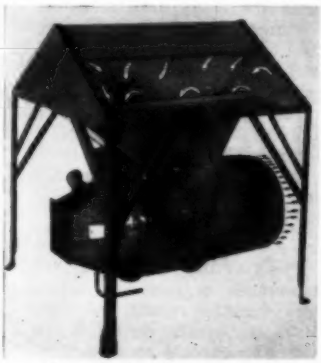
Presenting briefly, certain outstanding features of new or improved materials, supplies and equipment which have been developed and made available for use in modern industrial finishing departments

Twin Exhaust Bench

The Paasche Airbrush Co., 1921 Diversey Pky., Chicago, Ill., announces a twin exhaust bench with underslung fireproof ventilating unit "for rapid aircoating and air-coloring of small articles or mouldings."

These all-metal benches are of special design, constructed to permit maximum light and working space and easy to keep clean. Uniform suction throughout the entire area is obtained through diffuser plates.

The center divider or partition prevents off-spray from disturbing operators on the opposite side of the exhaust bench. An explosion-proof ventilating unit is underneath, out of the way, safe from fire hazards, as the motor is fully enclosed and cooled by fresh outside air, thereby preventing overheating.



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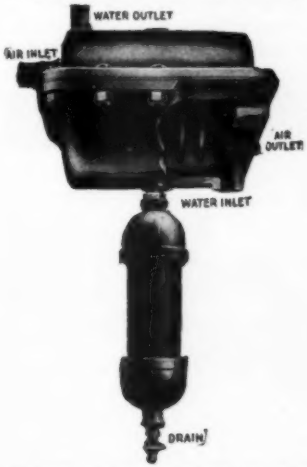
Eureka Air Filter

The Eureka Pneumatic Spray Co., 128 White St., New York City, announces the development of a new separator for extracting oil and moisture from the air used for spraying. This device is water-jacketed and connected to the water supply. The circulating water chills the baffles in the air-chamber to about 20° below room temperature, thus, the moisture is condensed out of the air as it passes through the condenser and



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comes in contact with the chilled baffles.

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New Synthetic Resins

The Rezinels, synthetic resins, recently introduced by the Glyco Products Co., Bush Terminal, Brooklyn, N. Y. have found two new applications of interest, according to a recent announcement.

1. By grinding pigments in the liquid Rezinel, each particle of pigment becomes enveloped in a thin film of liquid resin. This prevents troublesome caking and lumping in finished paints, varnishes, etc.

2. The liquid Rezinel, in conjunction with rubber latex and aluminum bronze or other metallic powders and the usual pigments, is being used for printing and coating wallpaper, textiles, leather, etc. This gives a flexible adherent durable film.

The harder varieties of Rezinels are being used alone or in conjunction with other varnish gum to promote adhesion and flexibility in metallic stamping inks and gold leaf products.

The hardest grade of the Rezinels is being blended with concentrated rubber latex to produce a synthetic chicle for chewing gum and similar elastic products.

Small Spray Outfit

The DeVilbiss Co., Toledo, Ohio, announces a complete one-man spray-painting outfit, the NK-606 . . . electrically operated and of light and durable construction. It can be transported from place to

place in an ordinary automobile, and is easily carried by one man.

Portable, compact, economical

The NK-606 will adequately handle comparatively extensive maintenance work, including the finishing of interiors, furniture and equipment. It is also an effective means of spraying insecticides, germicides, etc.

The outfit consists of one ½-h.p. electric motor driven compressing equipment mounted on a caster base, one pressure-feed spray gun with wrench, one 2-gallon pressure-feed paint tank, one 20-ft. length of 5/16-in. air hose and connections, one 12-ft. ¼-in. braid covered hose and connections, and one 12-ft. length of 5/16-in. fluid hose and connections.

It has been said, "The pain of a new idea is one of the world's commonest intellectual discomforts."

Valspar Elects Officers

At the annual meeting of the stockholders of the Valspar Corp., 456 Fourth Ave., New York City, manufacturers of varnish, lacquers, and paint, the following officers were elected:

Chairman of Board..F. W. Davis, Jr.
President.....Lawrence Phillips
Vice President.....T. R. Wyles
Vice President.....H. S. Boutell
Vice President.....S. M. Koplar
Vice President.....Leonard Mould
Secretary.....L. Allen Osborne, Jr.
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Industrial Finishing
MAGAZINE

Issued fifteenth of each month. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

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EDITORIAL

Where to Use Luster

Why do we prefer our motor cars looking bright and shiny—reflecting the light with a high luster finish and polished chromium—while at the same time we want the finish on our fine furniture and interior woodwork to be more subdued, if not actually dull in luster? In fact we prize very highly some of the antique furniture and interior paneling—and these surfaces naturally are almost if not entirely devoid of luster. Isn't this preference due to the fact that consciously or unconsciously we are showing our recognition and appreciation of what is really appropriate for the different natural materials on which finishes are used?

Metal is a hard substance which when smooth and polished takes on a rather high luster naturally, whereas wood, being more porous and of grained texture, does not take on a natural high gloss when it is planed clean and smooth in the white. As a matter of fact, wood doesn't need a high gloss surface to enhance its beauty. It possesses a natural beauty of color, grain, texture and figure in a pleasing combination that defies duplication. On wood a natural finish with high gloss has the effect of cheapening Nature's splendid handiwork, whereas a true natural finish, dull in luster, enhances the text and preserves the inherent beauty of the wood—and this is intuitively recognized by people of good taste.

Painting the Modern Way

Methods and materials developed primarily for use in industrial finishing—that is, the preparation and finishing or painting of manufactured products in factory paint shops or finishing departments—are rapidly being extended to other fields such as interior finishing and decorating, maintenance painting and outside painting. The use of lacquers and spray equipment, along with other materials and equipment ordinarily associated with industrial finishing, are becoming commonplace in these other fields. Concerns that make a business of painting, finishing, and decorating are inquiring about the latest materials, methods, and equipment adaptable to their line of work; and these companies are taking advantage of the power of advertising to proclaim their progressiveness, too.

On the very serviceable blotters one firm distributes, these significant words appear in appropriate display type: "Painting the

modern way by spray system night or day; saves time, money and annoyances." This firm is employing modern equipment and offering a real service to its possible and prospective customers.

Building Design and Color

The most striking example of modernistic design as applied to apartment buildings in this country has been realized in the completion recently of the new Beaux Arts apartments in New York City—two 16-story buildings occupying plots directly opposite each other.

Metal plays a prominent part in the decoration of these apartment buildings. The metal work of main exterior entrances, the balconies surrounded by open-work metal, such as features many of the apartments and studios, and the exteriors of the many windows—these are painted a brilliant red in most places, particularly the long individual apartment balconies, or with the natural silvery finish of chromium plate.

Ground floor lobbies are finished in modernistic effects with brown glass side walls and chromium plate trim.

Chromium plate trims in geometric designs trim the metal exteriors of elevator doors.

Contrasting color schemes enter into the face brick exteriors with a pronounced horizontal effect to the entire front facades. Salmon and black bricks for piers between windows, and light bricks for the remainder of the building form these horizontal line effects.

Finish; a Sales Appeal

The sales appeal of good finishing is something that cannot be denied or even questioned, and the fallacy of attempting to lower production costs by cheapening the finishing is so apparent that it is a matter of surprise to note its prevalence.

Volume production will lessen factory costs, and volume sales will absorb and take care of such added production, if they can be secured.

So, turning the cold reasoning of sound logic on this question, can additional sales be better secured when an article is cheaply finished, or when it is finished in a manner that will offer a sales appeal to the prospective buyer?

O'Connor Joins Day & Co.

Thomas E. O'Connor who for the past ten years has been with S. C. Johnson & Son, is now connected with James B. Day & Co. of Chicago as formulating superintendent, in charge of the enamel and varnish departments.

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